

**WHAT IS CLAIMED IS:**

- 1 1. An opto-mechanical interface apparatus comprising:  
2 an optical hybrid;  
3 an electronic hybrid adapted to receive electronic components;  
4 an adapter fixture for fixing the electronic hybrid and the optical hybrid to one another  
5 to form a combined hybrid;  
6 a lower-capsule part;  
7 an upper-capsule part adapted to mate with the lower-capsule part; and  
8 wherein mating of the upper-capsule part and the lower-capsule part encloses at least  
9 part of the combined hybrid.
- 1 2. The apparatus of claim 1, wherein the optical hybrid comprises:  
2 an optical chip;  
3 an optical-fiber connector; and  
4 a carrier.
- 1 3. The apparatus of claim 2, wherein the optical chip is selected from the group  
2 consisting of a transmitter chip and a receiver chip.
- 1 4. The apparatus of claim 1, wherein the lower-capsule part comprises airing holes.
- 1 5. The apparatus of claim 1, wherein the upper-capsule part comprises airing holes.

1     6.     The apparatus of claim 1, wherein the upper-capsule part and the lower-capsule part  
2     are mated together via at least one of snap-locking, gluing, and ultra-sound welding.

1     7.     The apparatus of claim 1, wherein:  
2     the upper-capsule part and the lower-capsule part are mated together; and  
3     the mated-together upper-capsule part and lower-capsule part form at least one cavity.

1     8.     The apparatus of claim 7, wherein the at least one cavity comprises an upper cavity  
2     and a lower cavity.

1     9.     The apparatus of claim 8, wherein:  
2     a first portion of the electronic components is contained within the upper cavity; and  
3     a second portion of the electronic components is contained within the lower cavity.

1     10.    The apparatus of claim 9, wherein:  
2     the first portion of the electronic components comprises receiver electronics; and  
3     the second portion of the electronic components comprises transmitter electronics.

1     11.    The apparatus of claim 1, wherein:  
2     the electronic hybrid comprises a printed circuit board (PCB); and  
3     the electronic components are mounted on the PCB.

1    12.    The apparatus of claim 1, wherein the PCB comprises:  
2           a pin for making an external electrical connection; and  
3           a stud for providing stability during assembly.

1    13.    The apparatus of claim 1, wherein the lower-capsule part comprises a lead-through for  
2    receiving a protrusion of the electronic hybrid, the protrusion selected from the group  
3    consisting of a pin and a stud.

1    14.    The apparatus of claim 1, wherein the lower-capsule part is adapted to permit accurate  
2    positioning of the combined hybrid.

1    15.    The apparatus of claim 1, wherein the upper-capsule part is adapted to fix contents of  
2    the apparatus.

1    16.    The apparatus of claim 1, wherein the optical hybrid comprises at least one of:  
2           at least one fiber;  
3           at least one transmitter; and  
4           at least one receiver.

1 17. A method of assembling an opto-mechanical interface apparatus, the method  
2 comprising:  
3 forming a combined hybrid, the step of forming the combined hybrid comprising:  
4 attaching an adapter fixture to an electronic hybrid; and  
5 attaching an optical hybrid to the electronic hybrid;  
6 placing the combined hybrid in a first capsule part;  
7 mating a second capsule part with the first capsule part; and  
8 wherein mating of the first capsule part and the second capsule part encloses at least  
9 part of the combined hybrid.

1 18. The method of claim 17, further comprising testing functionality of at least one  
2 component of the apparatus prior to the mating step.

1 19. The method of claim 17, wherein the steps are performed in the order listed.

1 20. The method of claim 17, wherein the step of mating is performed via at least one of  
2 gluing, snap-locking, and ultra-sound welding.

1 21. The method of claim 17, wherein the step of placing comprises positioning the  
2 combined hybrid in the first capsule part.

1 22. The method of claim 17, wherein the step of mating comprises fixing contents of the  
2 apparatus.

- 1    23.    The method of claim 17, where in the first capsule part is a lower-capsule part and the
- 2    second capsule part is an upper-capsule part.